

Amendments to the Claims

1. (Original) A method for making polymer-supported metal nanoparticles, comprising:
providing a polymer support material;
contacting the polymer support with an appropriate metal nanoparticle or metal nanoparticle precursor;
contacting the polymer support material and metal or metal precursor with a fluid that swells the polymer support material sufficiently to allow the metal or metal precursor to diffuse into the polymer support material; and
if present, reducing the metal precursor to provide a metal nanoparticle.
2. (Original) The method according to claim 1 where the polymer support material is a plastic.
3. (Original) The method according to claim 1 where the polymer support material is a polyalkylene polymer, a substituted polyalkylene polymer, a halogenated polymer, a polyester, or combinations of such materials.
4. (Original) The method according to claim 1 where the polymer support material is polyethylene, polypropylene, polybutylene, poly(4-methyl-1-pentene), poly(tetrafluoroethylene), perfluoroalkyl-tetrafluoroethylene copolymer, polyimide, polybenzimidazole, and combinations of such materials.
5. (Original) The method according to claim 1 where the plastic support material is high density polyethylene, perfluoroalkyl-tetrafluoroethylene copolymer, or combinations thereof.

6. (Original) The method according to claim 1 where the metal or a metal of the metal precursor is palladium, rhodium, platinum, iridium, osmium, gold, nickel, iron or combinations thereof.
7. (Original) The method according to claim 1 where the metal nanoparticle comprises an alloy or aggregate of two or more different metals.
8. (Original) The method according to claim 1 where the metal precursor includes at least one moiety selected from the group consisting of phosphates, β -diketones, phosphine oxides, dithiocarbamates, crown ethers, and combinations thereof.
9. (Original) The method according to claim 8 where the moiety is selected from the group consisting of tri-*n*-butylphosphate, tri-*n*-octylphosphate, triphenylphosphate, acetylacetone, trifluoroacetylacetone, hexafluoroacetylacetone, thenoyltrifluoroacetone, heptafluorobutanoylpivaroylmethane, 4, 4-trifluoro-1-(2-thienyl)-1, 3-butanedione, tri-*n*-butylphosphine oxide, tri-*n*-octylphosphine oxide, triphenylphosphine oxide, bis(trifluoroethyl)dithiocarbamate, diethyldithiocarbamate, H-crown, F2-crown, F6-crown, and combinations thereof.
10. (Original) The method according to claim 6 where the metal precursor comprises Pd(II).
11. (Original) The method according to claim 10 where the metal precursor comprises Pd(hfa)₂.
12. (Original) The method according to claim 6 where the metal precursor comprises Rh(III).
13. (Original) The method according to claim 12 where the metal precursor comprises Rh(acac)₃.

14. (Original) The method according to claim 1 further comprising contacting the support material in a pressure cell.
15. (Original) The method according to claim 1 where the fluid is carbon dioxide, nitrogen, nitrous oxide, methane, ethylene, propane or propylene.
16. (Original) The method according to claim 1 where the fluid is supercritical.
17. (Original) The method according to claim 1 where the fluid is supercritical carbon dioxide.
18. (Original) The method according to claim 1 where reducing a metal of the metal nanoparticle precursor comprises contacting the metal precursor with hydrogen.
19. (Original) The method according to claim 16 comprising hydrogen reduction at a pressure greater than ambient.
20. (Original) The method according to claim 16 where the hydrogen reduction is conducted at a pressure greater than ambient to a pressure of at least 300 atmospheres.

Claims 21–84 (Canceled)